

Certifying ICT Professionals

Using Internationally-recognised Certification to transform the NZ ICT Sector

NZCS Discussion Document

New Zealand Computer Society Inc

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Note that the term “ICT” has been used throughout this document. This is short for “Information and Communications Technology” and has the same meaning as “IT” (“Information Technology”) within this document.

Executive Summary

The NZ ICT Sector and businesses throughout NZ are facing a range of problems including a skills shortage (not enough people working in ICT in New Zealand), significant reduction in student intake into further ICT education (and reduction in the percentage graduating), negative perception of ICT as a career amongst the country's youth, lack of retention of skilled individuals in New Zealand and significant failure rates in major projects, especially at Government level.

Until now these have been considered as separate problems, however they are actually only symptoms of a larger problem – the lack of professional recognition within the ICT industry, and the lack of marketing of ICT as a worthwhile and valuable profession.

These issues can only be addressed by a change in focus – we must transform ICT practice into a true profession. This can only be achieved via the implementation of an internationally-recognised professional certification (or “charter”) programme, much like has been done in most other professions.

The NZ Computer Society's international kindred organisations have already begun the transformation of the sector via certification in other countries, and we need to ensure we move the NZ ICT sector to the forefront internationally by implementing internationally-recognised certification in New Zealand. Without this the ability of NZ ICT companies to compete on the global stage will be limited.

The NZCS has formed a Working Group which will investigate in detail the certification programmes implemented overseas by our kindred organisations, and construct a framework for the implementation of professional ICT certification in New Zealand. A key objective of this Group will be to consult and engage with industry, academia and all levels of government in NZ.

The projected costs and accurate timeframe of implementation will not be known until the Working Group has completed their report, however it is expected the cost will be between \$200,000 and \$400,000 with implementation completed no later than the end of 2009. The Society will be looking to Industry and Government to contribute to these costs.

The NZ Computer Society

With a 47-year history, the NZ Computer Society (NZCS) is the largest professional body of the ICT sector and actively works to raise the professional standards of ICT practitioners in New Zealand.

Through a range of collaborative initiatives, the Society works with industry, the educational sector and government to promote professionalism and ethical practices in ICT in New Zealand, as well as significantly contributing to ICT professional development internationally through our affiliation with professional societies and standards bodies throughout the world.

The Society views its role as being the conduit between the “three pillars” of ICT in NZ (industry, academia and government) to aid communication and collaboration in the sector, and to help all parties accept responsibility and actively participate in the transformation of ICT in New Zealand.

Introduction – Addressing the Challenges of the NZ ICT Sector

The ICT Sector is facing a number of difficult challenges in New Zealand and around the world and requires a substantive change in focus if we are to meet the ever-changing requirements of this diverse but essential sector.

The first step to finding a solution is identifying the problem correctly, and there is significant doubt over whether these issues have been truly considered from the correct perspective until now. For example, it is very easy to look at the symptoms of the problem and mistake these for the problem itself whilst actually ignoring the underlying issue. These include amongst other things:

- A major NZ and international ICT skills shortage;
- Significant reduction in educational intake at the tertiary level;
- Significant drop in quantity of graduates as a percentage of intake;
- Significant project failures or substantial cost over-runs due in part to inadequate qualified and experienced senior staff overseeing projects.
- Lack of consideration of professionalism in the sector;
- Lack of progress towards economic transformation (the innovative, high-wage and high-value economy);
- Negative and naïve perception of ICT as a career amongst the country's youth (and their parents);
- Lack of retention of skilled individuals in New Zealand;

Whilst these are sometimes viewed as the actual problems within our sector, the fact is these issues are simply symptoms of the wider problem. They cannot be significantly, adequately or permanently addressed until we, as leaders within the ICT sector, together with the true leaders throughout the three pillars of ICT (industry, academia and government) address this problem by seriously considering the root cause of these issues and begin to accept the need, and the responsibility, for transforming ICT into a true profession in New Zealand.

“Certified professionals take personal responsibility for their decisions and judgements and base them on experience and best practice. To deliver effective business transformation we need many more professionals in the ICT industry”

- Charles Hughes, Chair, I3P Task Force on International Certification

The Root Cause of the ICT Challenges in New Zealand

The following two issues have a causal link to all of the major issues outlined on the preceding page, and it is our view that it will not be possible to make a significant difference to the symptoms without addressing these root causes: *The lack of recognition of ICT as a Profession*, and *The lack of marketing of ICT as a worthwhile career*.

It should be noted that the second cannot be addressed before the first – it is not possible to meaningfully market ICT as a profession to potential ICT professionals if there is no formal recognition of ICT as a profession, and a Chartered/Certification status is the only way to meaningfully and significantly achieve this. This is not dissimilar to all other professions.

The Lack of Recognition of ICT as a Profession

It would be easy to read the list of issues on the previous page and draw a conclusion that those issues represent the problem, however they actually only form the symptoms of the underlying issue affecting stable ICT growth and innovation in New Zealand and many other parts of the world.

We believe the real issue at play is ***the widespread perception that the ICT sector has not matured into a true profession***. Basically, “ICT” has an image problem. There is a clear line between a practitioner and a professional in most other professions, however (due in part to the dynamic and diverse nature of ICT) there is no perceived distinction in ICT.

To take some examples, there is a difference between an Accounts Technician and a Professional Chartered Accountant. There is a difference between someone who likes to develop solutions to problems and a Chartered Professional Engineer. There’s a difference between someone who likes to build things and a Master Builder. There’s a tangible and significant difference between one who knows about the law and someone whom has been admitted to the bar.

Yet, perceptually, there is no difference between someone who works (or plays) with computers and an ICT professional, and until the definition of *what an ICT Professional actually is* is correctly defined and an internationally-recognised vendor neutral certification or chartered status is introduced to clearly define an “ICT Professional” (as distinct from a para-professional), this perception will remain and our ability to truly address the challenges facing our sector will be significantly impeded.

“Without action we can expect that fill rates will drop below 30% for vacancies over the next 3 years. ... Unless the IT sector takes significant action now this problem will restrict growth and cause wage costs to skyrocket.”

- Simon McCallum, University of Otago, “Computer Science Graduate Shortage” OUCS-2006-10, Oct 2006

The lack of Marketing of ICT as a Career

You will notice that the word “*perception*” has appeared several times. This is because many of the issues we aim to address surround the concept of the perception of ICT and the ICT Professional.

Whilst it is the critical element, building a Certification Framework and Chartered status is only the first step to addressing this problem. There must be an acceptance of the Chartered status amongst the industry, government, and educational sectors, an adoption en masse, and a campaign of active promotion to ensure the Certification (and by extension the ICT Sector) receives the same credibility in New Zealand as that adopted by our kindred organisations in many countries around the world.

The community, and in particular, the parents of talented school students, must see ICT as a profession on a par with Law, Accounting, Medicine, Dentistry and Engineering.

Additionally, the Government has to start taking this issue seriously at the secondary and even the primary education level through the education of students in what constitutes an ICT professional (rather than just “how to use a computer”). Accurate information outlining ICT as a worthwhile and exciting career is in short supply, and whilst initiatives such as *FutureInTech* are attempting to address the issue and making some progress, it is our belief that not enough funding is available to achieve the necessary level of success to address this problem once and for all.

“Raising the real and perceived standards for IT professionals is critical to both the success of the organisations they work for and the profession itself. The ability to attract, retain and develop the best quality staff, and create the environment where kids at school, both boys and girls, see IT as THE profession of the future is crucial.”

- David Clarke, Chief Executive of the British Computer Society

SFIA – Skills Framework for the Information Age

The *British Computer Society*, in conjunction with a number of other parties, created the SFIA Framework (Skills Framework for the Information Age) to provide a method of mapping an individual's professional skill level to a set of internationally-relevant standard levels. It is being adopted by the ACS and CIPS and is under active consideration by the EU, South Africa and the USA. It defines both the competencies of an individual and the competencies required for a standard job specification in agreed terminology.

The *SFIA Framework* is the skills framework underlying most international ICT certification programmes being implemented internationally by the Society's kindred organisations. This also provides a standard measuring regime to ensure true international recognition of a country's certification programme.

The framework provides a clear model for describing what ICT practitioners and users do and is constructed as a two-dimensional matrix.

Skills: One axis divides the whole of ICT into "skills". Skills are grouped for convenience into subcategories or "business roles". Subcategories are grouped into six categories or work areas - Strategy & Planning, Management & Administration, Development and Implementation, Service Delivery, Sales & Marketing, and Use. The SFIA structure allows a consistent approach to ICT skills across the organisation and is not limited to a specialist department.

Levels: The other axis defines the level of responsibility and accountability exercised by ICT practitioners and users. Each of seven levels - from new entrant to strategist level - is defined in terms of autonomy, influence, complexity and business skills.

Descriptors: The matrix shows the complete set of skills used by ICT practitioners and users. For each skill at each level, "descriptors" provide examples of typical tasks undertaken. A typical task for systems design at level 5 is "review others' system design to ensure selection of appropriate technology, efficient use of resources, and integration of multiple systems and technology".

The matrix is not fully populated, as most roles do not require people at every level of responsibility.

The Certification Programme will be designed to rank ICT Professionals using this framework.

Professional societies in many different countries are performing the ranking using considerably different programmes, with the international umbrella organisation *International Federation for Information Processing* (IFIP) providing the means to ensure each meets the requirements of a single certification framework, maintains a similarly high standard, and validates each under the international IFIP umbrella thus achieving international recognition and consistency whilst also allowing for a Certification Programme built from the ground up to be suitable for the environment of the practitioner.

Visit www.sfia.org.nz for more information on the SFIA Framework, or www.sfiaplus.org for more information on the advanced model incorporating a 3 dimensional training path to professionalism.

Rationale of NZCS as the Implementer of a Chartered Status

The NZ Computer Society's role is to promote professionalism within the ICT Sector. By definition, this problem is one of professionalism; hence the NZCS is the logical organisation to take the lead role in the adoption of international certification and a chartered status in ICT in New Zealand.

An essential component of any successful certification system is international recognition. If we are to look at certification in other sectors, in many cases the success or failure can be neatly divided based on whether the certification attained global recognition.

The certification models being investigated are all linked with the international drive towards the maturity of the ICT sector through certification by professional ICT societies throughout the world, and under the umbrella of the *International Federation for Information Processing* (IFIP). See www.ifip.org.

Initially established by *UNESCO*, *IFIP* is a large globally-recognised umbrella organisation with the professional organisation of each country as members (except the USA where both *ACM* and *IEEE* are members). *IFIP*'s role in certification is one of verifying and validating professional certification under a single international framework to ensure that Member Societies' certification and chartered status is recognised in the global market.

This initiative is being predominantly championed by the *British Computer Society* (BCS), *Australian Computer Society* (ACS), *Canadian Information Processing Society* (CIPS), plus the *Singapore Computer Society* and *IEEE Computer Society* throughout the USA. The NZCS is the New Zealand member of *IFIP*. The NZ Computer Society's links with these organisations ensures that certification implemented by the NZCS will be recognised internationally, which is absolutely essential to the acceptance of certification in New Zealand.

An important point is that the implementation and acceptance of certification and its impact on the sector is being proven in several overseas jurisdictions. The implementation of the *Chartered IT Professional* (CITP) status by the *British Computer Society* in the UK, a status recognised by the three pillars (Industry, Government and Education), has led to an increasingly rapid transformation of the sector and significant improvement in the professional standards, reputation and recognition of ICT professionals in Britain and in the successful delivery of complex projects.

It will not be long before NZ companies wishing to compete in the global economy will require staff with an internationally-recognised certification status to be acceptable, and this is already beginning to happen in Britain and several other countries around the world.

"It's time NZ got serious about being at the forefront of ICT delivery internationally, and as New Zealand's advocate of ICT Professionals, the NZCS is keen to work very hard with government, industry and academia to ensure NZ cements our place on the world ICT stage via Internationally-recognised Certification."

- Don Robertson, NZCS President, 2008

NZCS Certification Working Group

Establishment of the Working Group

The NZ Computer Society has established a Working Group to investigate the methods and programmes of implementation of Certification internationally, which will consult widely with industry, academia and government in New Zealand, and finally recommend an implementation model to the Society's National Council. A brief profile of the Working Group members is contained in Appendix 2.

Given the importance of Certification to the ICT Sector, the Working Group is chaired by the NZCS President (Don Robertson) and include NZCS Chief Executive Paul Matthews, Deputy President David Cowman, plus four others hand picked for their suitability and background.

Members of the Society's National Council have already visited the UK and Australia to ensure we understand their approaches, and have consequently been offered assistance from these kindred organisations for the establishment of a credible and internationally-recognised certification programme in New Zealand.

The full Terms of Reference for the Working Group are available on the NZCS website (www.nzcs.org.nz), and it is expected that this work will be completed within 12 months, with another group then being formed to oversee implementation of the accepted Certification Programme.

Consultation with Industry, Education and Government

Whilst we intend to investigate in-depth the programme and structure of certification successfully implemented by our kindred organisations in other jurisdictions, we need to ensure that the implementation of certification in New Zealand is accepted by the three pillars of the ICT Sector – Industry, the Educational Sector, and Government.

It should be noted that acceptance by Government does not necessarily require the creation of a legislative structure. The BCS, for instance, has implemented a massively successful Certification programme, without legislative backing, but with the strong support of the British government. Having said that, legislative backing may speed up the adoption of certification in New Zealand and hence enable New Zealand organisations to compete with a higher degree of credibility in the global market.

The Society is ideally positioned to complete this consultation being the representatives of ICT Professionals in New Zealand and our unique links with all three "pillars". We are currently in the process of informally consulting each, however one of the key requirements on the Certification Working Group is to widely consult with all three areas (and others) to ensure we are addressing the issue in the most suitable manner for New Zealand.

The Working Group is consulting and engaging with all levels of government and will set up an advisory group and invite representatives from the Tertiary Education Commission (TEC), State Services Commission (SSC), Ministry of Education (M.Ed), Ministry of Economic Development (MED), Standards NZ, Digital Strategy Advisory Group (or a successor) plus other interested governmental and non-governmental parties such as *IPENZ*.

The Working Group will also consult with other representative groups such as InternetNZ, TUANZ, Women in Technology, ALGIM, GOVIS, and the Software Association.

In regards to the Academic Sector, the Working Group will set up a second Advisory Group made up of representatives from a number of tertiary institutions, as well as the National Advisory Committee on Computing Qualifications (NACCQ), NZ Qualifications Authority (NZQA), Post Primary Teachers Association (PPTA), the Vice Chancellors Committee and other relevant organisations.

The Working Group will also extensively consult with large and small ICT organisations directly as well as the business community in general. This second part is essential – the problems facing ICT significantly impact upon non-ICT companies as well – these are business issues. Certification cannot be achieved unless we meet the requirements of business.

Tentative Certification Working Group Roadmap

February 2008	Creation of NZCS Working Group to investigate implementation model
March 2008	Finalisation of the Terms of Reference for the Working Group; Establishment of Advisory Groups to assist with the consultation
April – July 2008	Consultation with NZ industry, academia and government
May 2008	Delegation visiting Australian Computer Society (ACS) in Sydney
August 2008	Delegation visiting British Computer Society (BCS) in London
September 2008	Attendance of Working Group representative(s) to International <i>IFIP</i> World Congress in Milan, Italy (presentation and investigation of international professional certification implementations)
November 2008	Presentation of draft Implementation Plan to NZCS National Council
Jan/Feb 2009	Governance group formed, and implementation begins
End of 2009	Certification Programme implemented and operational in New Zealand

Fiscal Implications

Implementation of Certification in New Zealand will be a complex and difficult task and it is accepted that this will also involve significant cost.

Whilst the NZCS will provide some funding for this process, external initial seed funding would be appropriate to assist in this initial complex work. Following on, in 2009 the Society will also be looking to Government and Industry to contribute to the costs of implementing the Certification Programme.

Given the level of activity in related areas from various government departments, we believe the NZ Government realises it's time to get serious about "fixing" the ICT sector in New Zealand, and this can only be achieved through an internationally-recognised Certification Programme implemented independently, but with assistance, contribution and support from Government.

A full analysis of the likely implementation costs will be conducted as part of the Working Group's brief and further information will be available then. Whilst not wanting to prejudge the work of the Working Group, it is assumed that the professional implementation of internationally recognised certification in New Zealand, if done correctly, will cost somewhere between \$200,000 and \$400,000 NZ dollars.

Costs associated with Tools/Systems, Promotions, and ongoing Operational Costs are yet to be determined.

Appendix 1: Online Resources

The following online resources should assist in gathering more information about the global move towards international certification:

www.nzcs.org.nz	New Zealand Computer Society
www.acs.org.au	Australian Computer Society
www.bcs.org	British Computer Society
www.cips.ca	Canadian Information Processing Society
www.futureintech.org.nz	FutureInTech (a service provided by <i>IPENZ</i>)
www.ifip.org	International Federation for Information Processing
www.ipenz.org.nz	Institute of Professional Engineers New Zealand
www.sfia.org.nz	Information on the Skills Framework for the Information Age (SFIA)

Appendix 2: Members of the Certification Working Group

The following seven New Zealand ICT leaders make up the core Certification Working Group:



Don Robertson (Chair)

As well as being President of the Society, Don is a senior consultant heavily involved in Meridian Energy's retailing transformation initiative, a direct/programme management role in a large change project. Don previously held a number of senior positions within prominent NZ companies and brings a high level of industry experience to the group. Don also owns a Wellington software company.



Craig Pattison

Craig was the founding President of itSMFnz as well as Immediate Past Global Director of Certifications and Qualifications for itSMF International (the IT Service Management Forum). Craig also represents NZ on a number of International Standards such as ISO/IEC 20000 (IT Service Management), and IT Governance. Craig brings a wealth of knowledge of certification, both locally and globally.



Janet Mazenier

Janet was recently the NZ Digital Strategy Programme Manager for the Ministry of Economic Development and now works as a consultant to clients including MED, SSC and ACC. She is an advocate for ICT and how it enables business growth and empowers individuals and communities. Janet was Telecom's Programme Manager for *Project PROBE* and has worked for companies such as IBM, Lucent and Unisys.



Paul Matthews

Paul is the NZCS Chief Executive and one of the key drivers of the organisational and cultural changes currently occurring within the organisation. Paul comes from a business background having been CEO of a successful NZ-owned ICT consultancy for the last 6 years, as well as working as a business consultant with Director-level involvement in a number of other ICT-related organisations.



Steve MacDonell

Steve is Professor of Software Engineering at AUT and is highly regarded in his field. Bringing an academic perspective to the group, he has a strong Software Engineering background including previously working as Head of School for Otago University's Information Science Programme, and now Professor and Director of SERL (Software Eng. Research Lab) at AUT.



David Cowman

Dave is the Society's Deputy President and is based in Taupo where he is the ICT Manager for the Central Plateau's largest accounting firm. Dave was previously Founder and Director of an ICT consultancy, has held several ICT-related positions in Local Authorities and is a former Primary and Secondary teacher. He provides a good "sounding board" for Certification from regional New Zealand.



Peter Cornelius

Peter is an ITO Service Delivery Consultant at Hewlett Packard. With a background in Certification achievement and delivery from an industry standpoint, Peter brings a high level of practical experience to the group. Peter has been a Microsoft Certified Trainer (MCT) and A+ Certified Trainer and has a history of creating and implementing training programmes and packages in numerous organisations.